compare performance of the median performing test samples in each device category at each of the test channels. Keep in mind that cable converters do not tune to broadcast channel 59 and, therefore, no cable converter data is presented for this test channel.

Comparative results presented in Figure 3.15 represent performance of the median test sample oriented for maximum susceptibility. The results presented in Figure 3.16 represent performance of the median test sample considering the average of the measurements made at the eight incremental orientations (average susceptibility).

As demonstrated by the figures, significantly higher field strengths are required to produce "just perceptible" interference in the median cable converter than are required to produce "just perceptible" interference in television receivers or VCR's. The figures also show that there is little difference in the performance of the median television receiver and the median VCR on each of the test channels.

Figures 3.17 and 3.18 present a graphical comparison of the radiated susceptibility performance of the median test sample considering performance on all three test channels. Channel 59 test results are excluded in the median sample performance due to the fact that no cable converter data is available for this channel. These figures again show that cable converters exhibit an approximate 15 dB higher tolerance to DPU interference fields than do television receivers or VCR's. The figures also show a 6 to 9 dB difference between average susceptibility and maximum susceptibility performance for the median performing receiver in each device category.

3.4.2 Conducted Current Susceptibility Test Results

Conducted current susceptibility tests were performed on the sample population of 35 television receivers, 8 VCR's, and 13 cable converters in accordance with the procedures described in Section 3.3.5. Tests were performed with a current injected onto the shield of the input coaxial cable and again with a current injected onto the AC power cable. Tests were performed at test channels 6 and 12. The test results are presented in a tabular and graphic format in the following Sections.

3.4.2.1 Television Receiver Conducted Current Susceptibility Test Results

Tables 3.15 and 3.16 contain tabulations of the shielding effectiveness figure of merit for television receiver conducted current susceptibility. Table 3.15 presents the results for cable channel 6, and Table 3.16 presents the results for cable channel 12. The figure of merit data is presented in order of the worst performing test sample to the best performing test sample with respect to conducted current on the input coaxial cable shield. The order of performance may be significantly different with respect to

FIGURE 3.17 FIELD STRENGTH REQUIRED TO PRODUCE "JUST PERCEPTIBLE" INTERFERENCE IN THE MEDIAN TEST SAMPLE CONSIDERING ALL TEST CHANNELS

ORIENTATION OF MAXIMUM SUSCEPTIBILITY

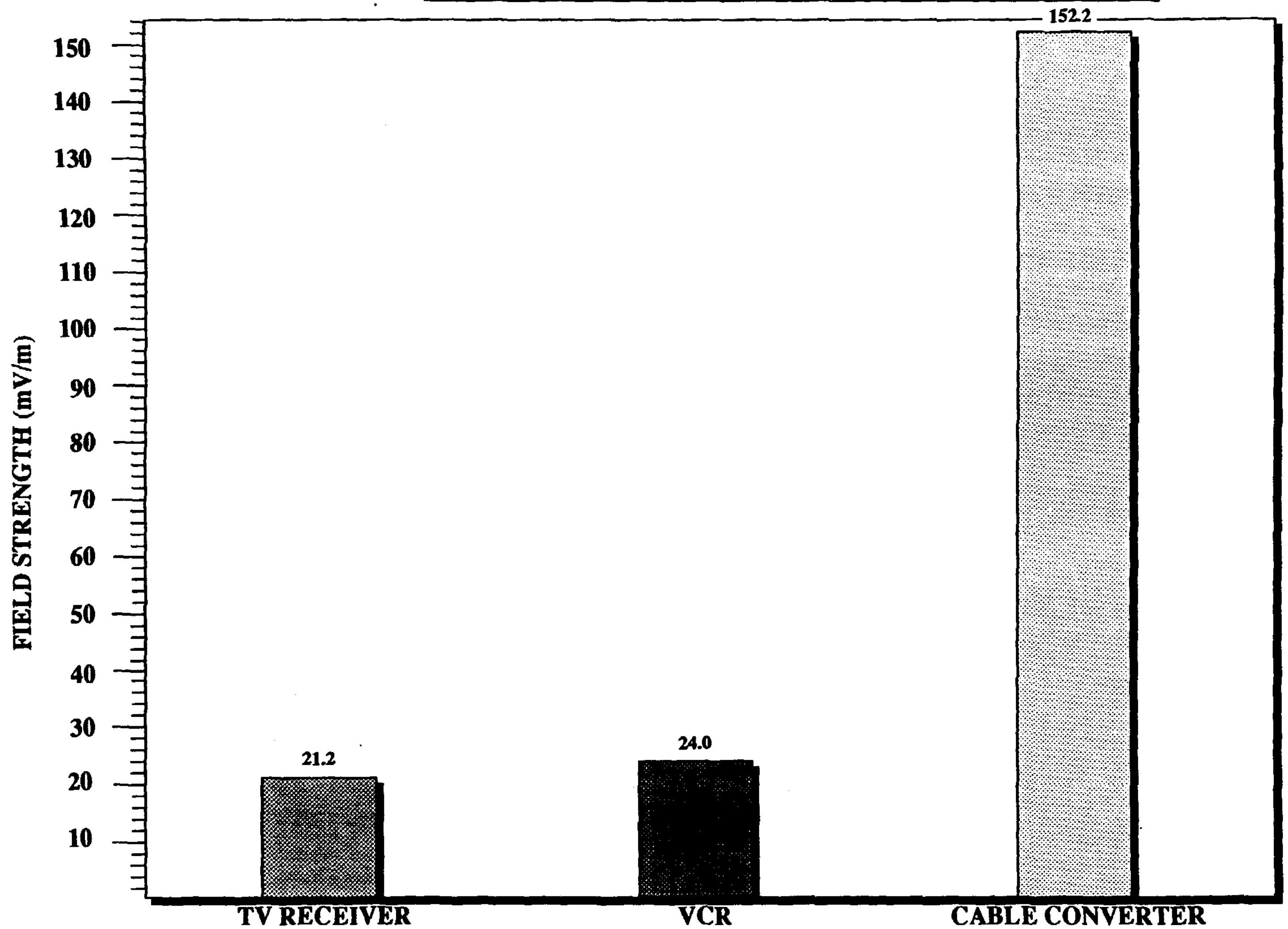

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FIGURE 3.18 FIELD STRENGTH REQUIRED TO PRODUCE "JUST PERCEPTIBLE" INTERFERENCE IN THE MEDIAN TEST SAMPLE CONSIDERING ALL TEST CHANNELS

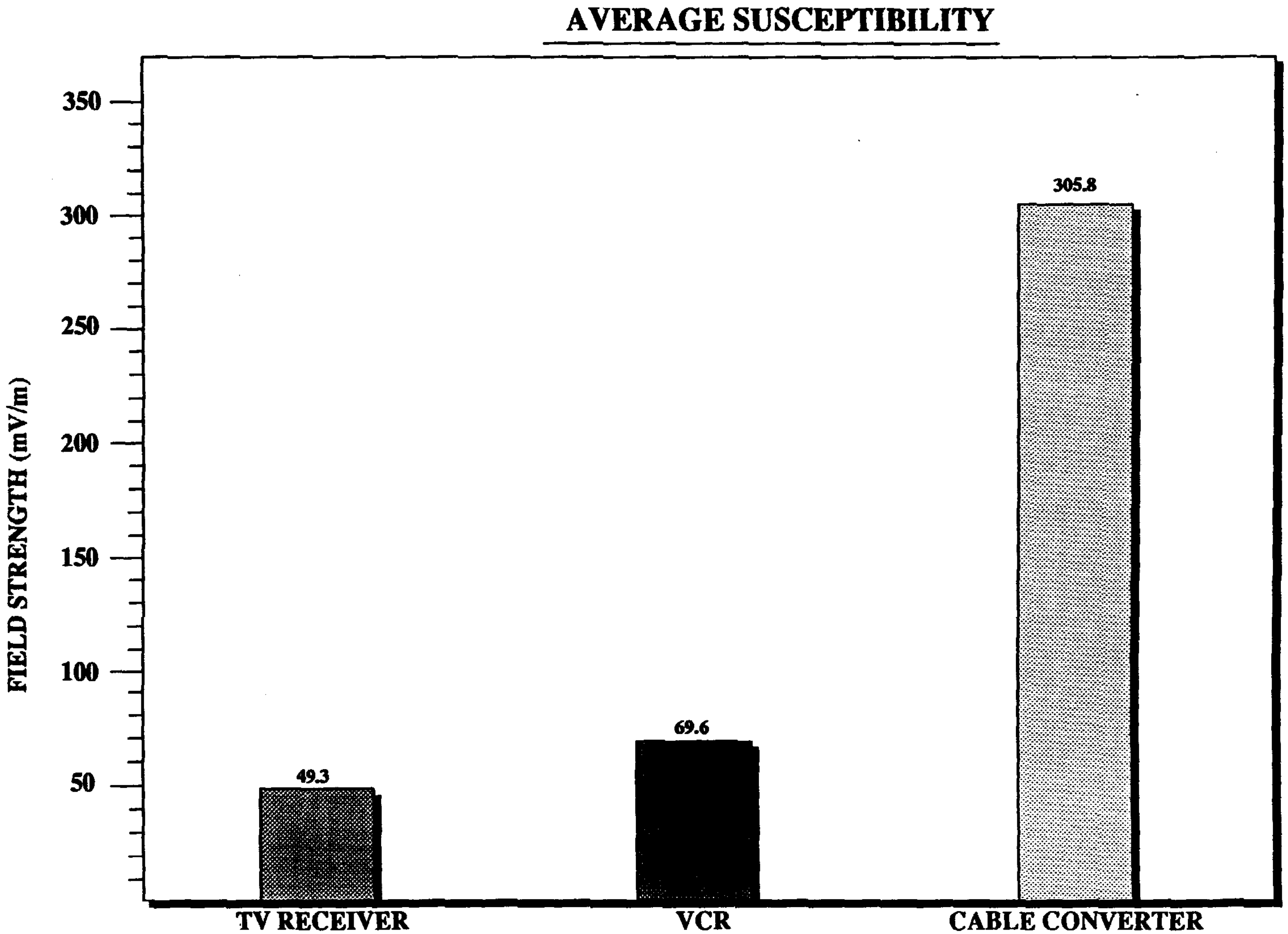

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TABLE 3.15
DPU SHIELDING EFFECTIVENESS FIGURE OF MERIT CONDUCTED CURRENT SUSCEPTIBILITY

TELEVISION RECEIVERS

CABLE CHANNEL 6 (82–88 MHz)

SAMPLE NO.	RF INPUT CABLE SHIELD	AC POWER CABLE
034	62.6	69.6
027	65.1	71.6
028	65.6	76.6
019	66.1	77.1
018	68.6	76.1
016	69.6	78.6
021	70.1	80.1
005	70.6	96.1
033	76.6	86.1
035	78.1	85.1
007	78.1	96.6
013	79.6	84.6
029	79.6	103.6
009	81.6	92.6
017	82.1	95.1
011	82.6	96.1
001	84.6	93.6
008	85.1 –MEDIAN	85.1
002	85.6	81.6
003	86.1	84.1
006	88.6	107.1
010	89.6	85.1
014	90.1	87.1
032	90.1	87.6
022	92.1	111.6
023	92.1	105.1
030	92.1	91.1 –MEDIAN
020	92.6	100.1
004	93.6	97.1
026	95.1	109.6
031	97.1	115.1
012	97.1	84.1
025	97.6	99.1
015	98.1	105.1
024	103.1	97.1

TABLE 3.16
DPU SHIELDING EFFECTIVENESS FIGURE OF MERIT
CONDUCTED CURRENT SUSCEPTIBILITY

TELEVISION RECEIVERS

CABLE CHANNEL 12 (204–210 MHz)

SAMPLE NO.	RF INPUT CABLE SHIELD	AC POWER CABLE
027	42.6	59.6
028	48.1	69.1
019	59.6	75.1
018	61.6	79.6
007	62.6	67.6
034	63.1	84.6
016	64.6	79.6
021	65.6	71.6
001	67.6	71.6
011	76.1	89.6
029	77.1	97.6
013	78.1	91.6 –MEDIAN
002	79.6	90.6
017	80.6	85.1
014	81.1	93.6
005	82.6	87.1
020	83.1	88.1
033	83.6 –MEDIAN	97.6
032	84.6	89.6
004	84.6	92.1
003	85.6	90.1
030	86.6	92.6
006	86.6	97.1
031	87.1	93.6
012	87.1	102.6
010	87.6	101.1
009	88.1	96.6
015	88.6	83.6
008	89.6	94.1
025	91.1	97.1
024	92.6	110.6
026	92.6	112.6
035	95.1	102.6
023	95.1	105.1
022	104.6	97.6

currents on the AC power cable. A median test sample is identified for the input coaxial cable test and for the AC power cable test.

There is an extraordinary range in the figures of merit between the best and worst performing television receivers. The range in performance between the best and worst performing test samples, averaged over the two test channels, is 56.7 dB (a factor of 682) for susceptibility to currents flowing on the input coaxial cable shield, and 50 dB (a factor of 318) for currents flowing on the AC power cable.

Of the 35 receivers tested on channel 6, 27 were more susceptible to currents flowing on the shield of the input cable than on the AC power cable, 1 was equally susceptible, and 7 were more susceptible to currents flowing on the AC power cable. At cable channel 12, only 2 receivers were more susceptible to currents flowing on the AC power cable, and 33 were more susceptible to currents flowing on the shield of the input coaxial cable.

A comparison of the figures of merit for the median test samples, at each test channel, indicate that in the median performing receiver, there is a 6 to 8 dB greater susceptibility to interfering currents flowing on the shield of the input coaxial cable compared to the AC power cable. This means that television receivers are, generally, 2 to 2.5 times more susceptible to DPU interfering currents flowing on the RF input coaxial cable shield than on the AC power cable. The difference in performance of the median test sample on the two test channels was less than 2 dB.

3.4.2.2 VCR Conducted Current Susceptibility Test Results

Tabulations of the figures of merit for VCR susceptibility to conducted currents are contained in Tables 3.17 and 3.18 for cable channels 6 and 12, respectively. Because there are an even number of test samples in this category, a median figure of merit was interpolated between the pair of median performing test samples as indicated by an asterisk.

The range in performance between the best and worst VCR test sample, averaged over the two test channels, is 26 dB (a factor of 20) for susceptibility to DPU interfering currents on the input coaxial cable shield, and 28 dB (a factor of 25) for DPU interfering currents on the AC power cable.

Six of eight test samples exhibited greater susceptibility to DPU interfering currents on the shield of the input coaxial cable than on the AC power cable at test channel 6. Five of eight test samples exhibited greater susceptibility to interfering currents on the shield of the input coaxial cable at channel 12. The average performance (all VCR's and both channels) of the 8 VCR's tested showed a 13.6 dB (a factor of 4.8) greater susceptibility to currents on the input coaxial cable shield than on the AC power cable.

TABLE 3.17
DPU SHIELDING EFFECTIVENESS FIGURE OF MERIT
CONDUCTED CURRENT SUSCEPTIBILITY

VIDEO CASSETTE RECORDERS

CABLE CHANNEL 6 (82–88 MHz)

SAMPLE NO.	RF INPUT CABLE SHIELD	AC POWER CABLE
107	84.1	91.6
106	86.6	88.1
102	90.6	96.1 *
103	95.6 *	101.1
108	97.6 *	94.9 *
104	99.1	115.6
105	103.1	94.6
101	107.1	116.1

NOTE: Because there are an even number of samples in this test no single median sample is indicated above. An interpolated figure of merit pertaining to the average of the two median samples is represented in the graphical analysis of Section 3.4.2.4.

TABLE 3.18
DPU SHIELDING EFFECTIVENESS FIGURE OF MERIT
CONDUCTED CURRENT SUSCEPTIBILITY

VIDEO CASSETTE RECORDERS

CABLE CHANNEL 12 (204–210 MHz)

SAMPLE NO.	RF INPUT CABLE SHIELD	AC POWER CABLE
103	77.1	109.1
106	81.6	96.6 *
107	82.6	94.1 *
104	89.1 *	98.6
102	91.6 *	90.6
105	96.1	111.1
108	96.1	83.6
101	104.6	86.1

NOTE: Because there are an even number of samples in this test no single median sample is indicated above. An interpolated figure of merit pertaining to the average of the two median samples (*) is represented in the graphical analysis of Section 3.4.2.4.

The input cable shield test results show a decrease in the median performance between test channels 6 and 12 of 6.1 dB. For the AC power cable test, the performance of the median receiver was unchanged between the two test channels.

A comparison of the figures of merit for the median television receiver and VCR test samples indicates that the median performing VCR is 9.5 dB less susceptible, than the median performing television receiver, to interfering currents flowing on the shield of the input coaxial cable, and 4.1 dB less susceptible to interfering currents on the AC power cable.

3.4.2.3 Cable Converter Conducted Current Susceptibility Test Results

Tables 3.19 and 3.20 contain the figures of merit for cable converter conducted current susceptibility. The range in performance between the best and worst cable converter test sample, averaged over the two test channels, is 27 dB (a factor of 22) for susceptibility to DPU interfering currents on the input coaxial cable shield and 36 dB (a factor of 63) for DPU interfering currents on the AC power cable.

A review of the tables indicates that approximately half of the cable converters were more susceptible to DPU interfering currents on the input coaxial cable shield and half of the cable converters were more susceptible to currents on the AC power cable.

The relatively high figures of merit for cable converters demonstrates a high degree of immunity in these devices to conducted currents. Comparing the figures of merit for the median performing cable converter to that of the median performing television receiver indicates that cable converters are approximately 20 dB less susceptible to DPU interfering currents than are television receivers. A similar comparison to the interpolated figure of merit for VCR's indicates that cable converters are 15 dB less susceptible to DPU interfering currents than are VCR's.

3.4.2.4 Graphical Comparison of Conducted Current Susceptibility Test Results

Figures 3.19 and 3.20 provide a graphical comparison of performance for television receivers, VCR's, and cable converters in terms of the current required to produce "just perceptible" interference. Figure 3.19 shows the performance comparison for interfering currents on the shield of the input coaxial cable; while Figure 3.20 shows the performance comparison for interfering currents on the AC power cable.

The figures clearly demonstrate that cable converters can tolerate much greater interfering currents than can television receivers or VCR's before the onset of DPU interference.

TABLE 3.19
DPU SHIELDING EFFECTIVENESS FIGURE OF MERIT
CONDUCTED CURRENT SUSCEPTIBILITY

CABLE CONVERTERS

CABLE CHANNEL 6 (82–88 Mhz)

SAMPLE NO.	RF INPUT CABLE SHIELD	AC POWER CABLE
216	95.1	96.1
224	103.1	113.1 –MEDIAN
201	104.6	111.1
222	104.6	116.6
220	104.6	114.1
206	105.1	96.1
208	105.1 –MEDIAN	115.1
203	106.1	101.1
218	106.6	104.6
214	115.1	104.1
209	115.6	116.6
212	120.1	120.1
204	123.6	119.1

NOTE: Of the 24 cable converters received, there are a total of 13 unique cable converters in the sample population.

TABLE 3.20
DPU SHIELDING EFFECTIVENESS FIGURE OF MERIT
CONDUCTED CURRENT SUSCEPTIBILITY

CABLE CONVERTERS

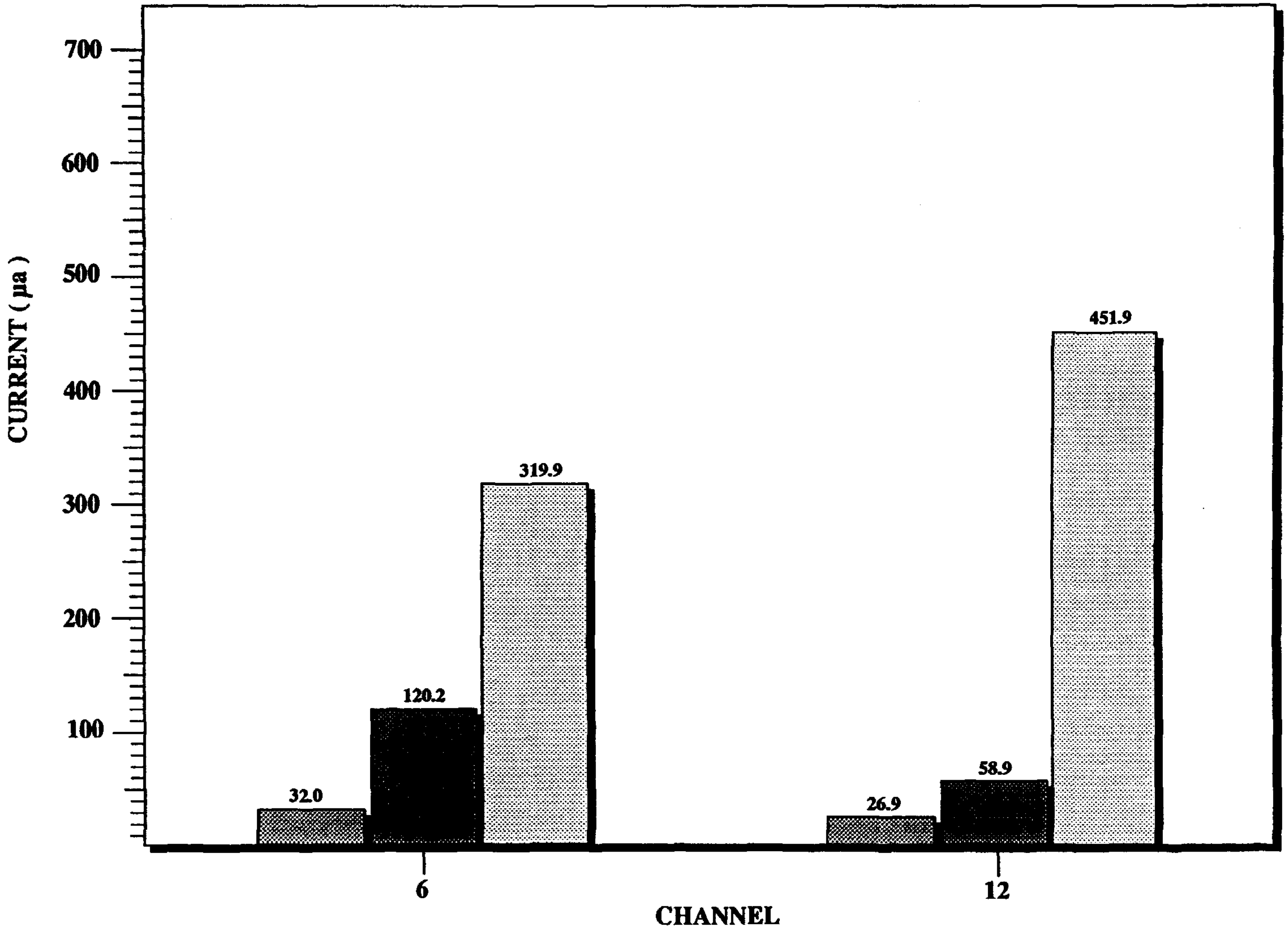
CABLE CHANNEL 12 (204–210 MHz)

SAMPLE NO.	RF INPUT CABLE SHIELD	AC POWER CABLE
203	95.6	108.6
201	99.6	115.6
204	100.1	89.6
212	106.6	117.6
206	107.1	95.6
214	107.6	109.6
216	108.1 –MEDIAN	83.6
208	109.6	117.6
209	110.1	113.6
224	112.1	108.6 –MEDIAN
218	114.1	98.6
220	114.6	107.6
222	121.1	111.6

NOTE: Of the 24 cable converters received, there are a total of 13 unique cable converters in the sample population.

FIGURE 3.19 CURRENT REQUIRED TO PRODUCE "JUST PERCEPTIBLE" INTERFERENCE IN THE MEDIAN TEST SAMPLE

INPUT COAXIAL CABLE SHIELD



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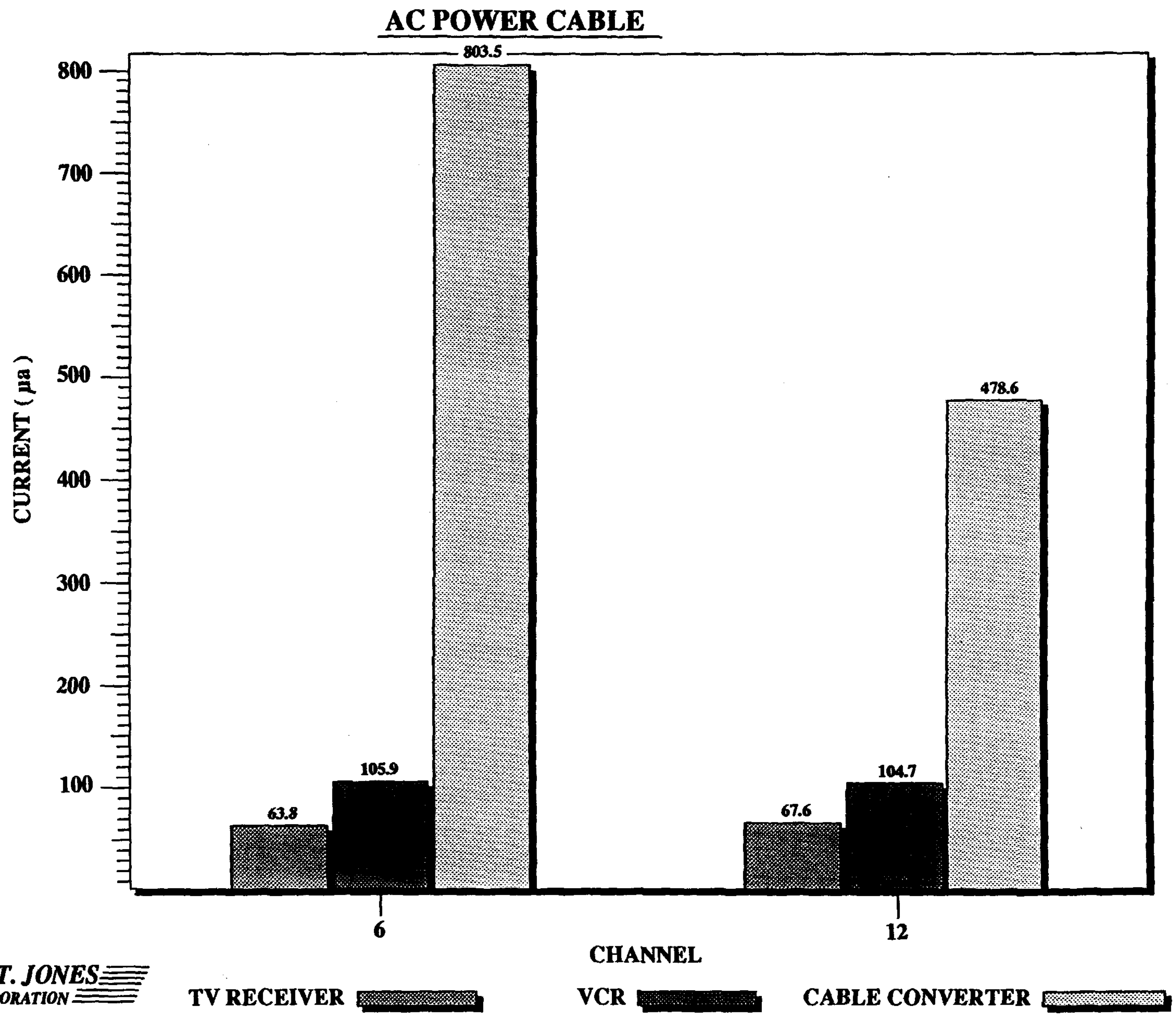
TV RECEIVER   VCR   CABLE CONVERTER

FIGURE 3.20 CURRENT REQUIRED TO PRODUCE "JUST PERCEPTIBLE" INTERFERENCE IN THE MEDIAN TEST SAMPLE



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Although there is no definitive data available at this time to quantify the magnitude of currents which might be present on the AC power cables and coaxial input cable shield in the consumer household, preliminary laboratory tests indicate that the currents required to create DPU interference in television receivers and VCR's can be created when the cables are subjected to relatively low ambient field strengths. Further study in this area may show that susceptibility to conducted currents may be a primary DPU ingress mode in many receivers, particularly at lower VHF frequencies.

4.0 Receiver Performance

4.0 Receiver Performance

4.1 Introduction

This Section of the report defines test methodologies and procedures for measuring certain receiver performance characteristics in modern consumer receiving equipment and presents test results on a sample population of 35 television receivers, 8 VCR's, and 13 cable converters. The eight receiver performance characteristics, which are addressed herein, relate directly to the interface between the cable delivery system and the consumer receiving device. Specifically, test methodologies, procedures, and results are presented for the following receiver performance categories:

- **Re-radiation of Cable Signals**
- **Local Oscillator Leakage and Backfeed**
- **A/B Switch Isolation**
- **DPU Backfeed**
- **VCR Through-Loss**
- **Adjacent Channel Rejection**
- **Image Rejection**
- **Tuner Overload Performance**

The first four performance categories listed above are related to potential interference to other cable subscriber equipment or other electronic devices. The last four performance categories relate to acceptable cable service.

Presented in Section 4.2 is a discussion of the test rationale and assumptions used in the development of the receiver performance test procedures. Section 4.3 presents the test methodology in each of the eight receiver performance categories. Detailed test procedures are presented in Section 4.4, and receiver performance test results are presented in Section 4.5.

4.2 Test Rationale and Assumptions

The complexity of conducting receiver performance tests on television receivers, VCR's, and cable converters can range from relatively straightforward to very complex. In designing the receiver performance test procedures contained here, an effort was made to develop procedures which were easily implemented and repeatable, and which place controls on the number and range of variables for a given performance category. A discussion of the rationale and assumptions used in developing the key elements of the receiver performance test procedures is presented in the following paragraphs.

4.2.1 Test Channels

Four standard test channels were selected to represent receiver performance over the range of cable channels between 54 MHz and 550 MHz. The selected standard test channels are:

Cable Channel	Frequency
3	60 - 66 MHz
12	204 - 210 MHz
53	396 - 402 MHz
74	522 - 528 MHz

Receiver performance tests are performed on the channels listed above with the exception of two performance categories: Re-radiation of Cable Signals and DPU Backfeed. With regard to re-radiation of cable signals, the aeronautical frequency bands (118 - 137 MHz and 225 - 400 MHz) represent the greatest potential for interference from radiated cable signals and, therefore, channels falling within these frequency bands were selected for this test. Tests for re-radiation of cable signals are performed on the following channels:

Cable Channel	Frequency
15	126 - 132 MHz
25	228 - 234 MHz
37	300 - 306 MHz
53	396 - 402 MHz

DPU backfeed measurements are performed on the same channels which were selected for DPU susceptibility testing of television receivers, VCR's, and cable converters as described in Section 3.0. The DPU backfeed test channels are as follows:

Channel	Frequency
Cable Channel 6	82 - 88 MHz
Cable Channel 12	204 - 210 MHz
Cable Channel 78	546 - 552 MHz
Broadcast Channel 59	740 - 746 MHz

4.2.2 Measurement Test Point Location

Objective tests are performed in the test procedures described herein and, therefore, access to an output test point location is required in each performance category with the exception of Re-radiation of Cable Signals. A review of the test requirements indicates that certain measurements can be performed at the RF input and/or output port of the Equipment Under Test (EUT). Other tests require access to the baseband video signal.

Tests which can be performed at the RF input and/or output ports of the EUT include: local oscillator leakage and backfeed, VCR through-loss, DPU backfeed, and certain A/B switch isolation tests. Tests which require access to the baseband video signal include: image and adjacent channel rejection, tuner overload, and the remainder of the A/B switch isolation tests.

For receivers which do not have a baseband video output port (most television receivers and cable converters), a suitable test point location must be identified. Since cable converters have an RF output port, a high quality demodulator can be used to produce the baseband video signal. Television receivers have no RF output port and, therefore, a measurement test point must be located within the video electronics to bring the video signal to the exterior of the receiver chassis. The test probe used in this process must have impedance characteristics which do not adversely affect the video signal. Since only relative measurements will be performed at the video baseband measurement test point location, knowledge of the circuit impedance at the measurement point location is not required. Because of the difference in ground potential which may exist within the video electronics, an isolation transformer must be used on all receivers which are modified with baseband video probes.

4.2.3 Desired and Undesired Signal Level and Modulation

The selected test channel is defined as the "desired" channel. In order to ensure that the AGC and AFC circuits within the receiver are functioning under normal conditions, the desired video carrier is modulated with a standard 0 IRE or 10 IRE flat field. The level of the video carrier is adjusted as defined in the detailed test procedures for each tuner performance category. The measurement of the desired video carrier level is referenced to the peak sync tip of the modulated carrier. The aural carrier on the desired channel is unmodulated and adjusted to a level 10 dB below the video carrier level.

Signals on other channels are input to the EUT to simulate other active channels delivered by the cable system. These signals are unmodulated carriers. The number, level, and frequency of the unmodulated carriers is dependent on the specific receiver performance characteristic under test. The level of each unmodulated carrier is referenced to the modulated video carrier level of the desired signal.

Any signal which is produced within the receiver, due to the presence of one or more other carriers at the receiver input or due to inadequate A/B switch isolation, and which falls within the video passband of the desired channel, is defined as an "undesired" or "interfering" signal.

4.2.4 Desired to Undesired Signal Ratio and Signal Substitution Method

It is common practice to measure and report certain types of interfering signal levels, in terms of a ratio, referenced to the desired video carrier level. This ratio is sometimes referred to as the carrier to interference ratio (C/I) or the desired to undesired signal ratio (D/U). In the test procedures for receiver performance, the term "D/U signal ratio" is used to describe the relative interfering signal level for the image rejection, adjacent channel rejection, and tuner overload performance categories.

It is desirable to determine the D/U ratio at the input to the EUT (cable delivery system interface) in order to take advantage of subjective data referenced to this location, and to allow direct comparison of receiver performance and cable delivery system performance at the same (interface) location. This can be accomplished through the use of a calibrated reference signal which is input to the EUT along with the desired signal. The calibrated reference signal is used as a signal substitute to reference interfering signal levels, as measured in the video baseband, to an equivalent D/U ratio referenced to the input of the EUT.

For example, assume that a video measurement set, having spectral noise display capability, is connected to the baseband test point location of a television receiver. A desired video carrier is input to the receiver and adjusted to a level of 0 dBmV and modulated with a 10 IRE flat field. With no interfering signals present, the spectral display (averaging mode) on the video measurement set will show a relatively flat noise spectrum across the 4 MHz video passband.

Now, an unmodulated video carrier on the image frequency (15 channels above the desired channel) is combined with the desired carrier at the input to the receiver. The unmodulated image video carrier is adjusted to a level 10 dB above the desired video carrier level (+10 dBmV). A line spectrum will appear in the baseband spectral display (image interfering signal) as a result of the newly added image carrier. The frequency of the line spectrum in the baseband video display, for conventional tuners, will be 1.5 MHz.

If the image carrier is removed from the input of the receiver and a calibrated reference signal is combined with the desired input signal at a frequency 1.5 MHz above the desired video carrier, a similar interfering signal will appear in the baseband spectral display. The input level of the reference signal can be adjusted until the level of the interfering signal, as observed in the baseband spectral display, is equal to the level observed when the image carrier was present. At this point, the interfering signal resulting from the image carrier has been directly replaced by an equivalent in-band interfering signal (signal substitute). By measuring the level of the reference signal at the receiver input port, an equivalent D/U signal ratio is determined for image interference referenced to the input of the receiver.

In this example, if the reference input signal (RF) were found to be -60 dBmV, then it can be stated that the equivalent in-band D/U signal ratio is 60 dB (0 dBmV - (-60 dBmV)). Image rejection for this receiver is calculated to be 70 dB (10 dBmV - (-60 dBmV)).

Notice that in the signal substitution measurement procedure, only relative values are important in the baseband measurement. Absolute measurements are only made at the input to the receiver where the impedance is known. Further, any noise introduced by the receiver or the measurement set is present in both the true interfering signal and the substitute signal and, therefore, is negated by the signal substitute measurement technique. The signal substitute technique is used in the measurement of image and adjacent channel rejection, tuner overload performance, and certain A/B switch isolation tests.

4.3 Test Methodology

This section addresses the methodology to perform the receiver performance tests in the eight performance categories. The descriptions herein provide a discussion of parameters to be measured, the recommended test instrumentation to perform each test, and the general procedures which will be followed. Detailed test procedures are contained in Section 4.4.

4.3.1 Re-radiation of Cable Signals

The FCC regulates signal radiation (leakage) from a cable delivery system under the technical standards of Part 76 of the FCC's Rules and Regulations. Cable operators are required, under this regulation, to maintain leakage throughout the delivery system at levels below the maximum allowable levels as delineated in the Rules. The test described here is designed to measure cable signal leakage from a television receiver, VCR, or cable converter when connected to a cable delivery system.

The test is performed on an FCC-approved, three-meter range where accurate and repeatable results are attainable. The EUT is placed on a rotatable non-metallic table, and the RF input is connected to a TV signal generator (video baseband generator and agile channel modulator). It is important to use a high quality, double shielded coaxial cable for this connection in order that coaxial cable leakage is not a contributor to the measured emission level.

A horizontally polarized tuned dipole antenna, spectrum analyzer, preamplifier, and calibrated signal source are used to measure the level of the radiated emission from the EUT. Block diagrams of the test and EUT configurations are contained in Figures 4.1 and 4.2.

For this test, the input level of the selected test channel video carrier is adjusted to +15 dBmV, and the video carrier is modulated with a 0 IRE or 10 IRE flat field. Radiated emissions measurements are made only on the video carrier frequency of the selected test channel. At each test frequency, the radiated emission is maximized by rotating the EUT through a 360 degree arc and raising and lowering the receive antenna between 1 and 4 meters above the ground plane.

The test is performed with the EUT powered and then repeated with power to the EUT turned off. If the EUT is equipped with an A/B switch at the RF input, a second test is performed with the unused port selected, i.e., if the input cable is connected to port A, port B is selected on the EUT. If the EUT is furnished with interconnecting cables, the radiated emissions are measured with the cables attached in a normal configuration.

4.3.2 Local Oscillator Leakage and Backfeed

The purpose of this test is to measure the level of the local oscillator signal and other spurious signals which emanate from the EUT and are conducted back toward the cable delivery system via the RF input coaxial cable. The equipment configuration for the local oscillator and backfeed measurement is shown in Figure 4.3.

The television signal generator consists of an agile channel modulator and baseband signal generator. This generator provides the desired modulated video carrier and unmodulated aural carrier. A directional coupler, preamplifier, and spectrum analyzer are used to measure the level of the local oscillator and other

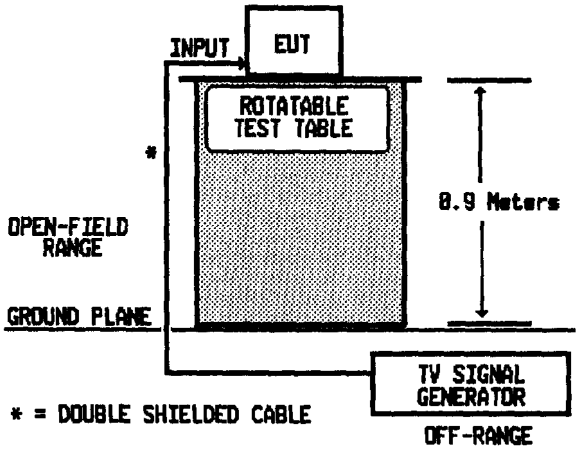

Figure 4.1 Re-radiation of Cable Signals EUT Configuration

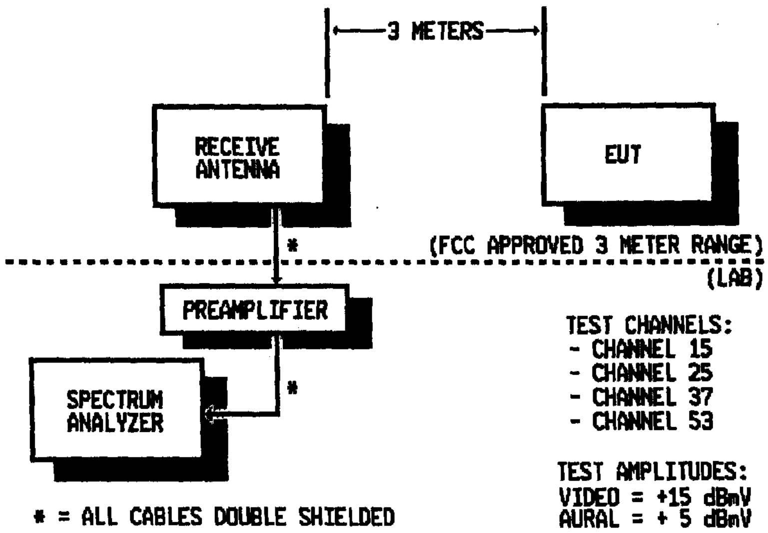

Figure 4.2 Re-radiation of Cable Signals Test Equipment Configuration and Test Parameters

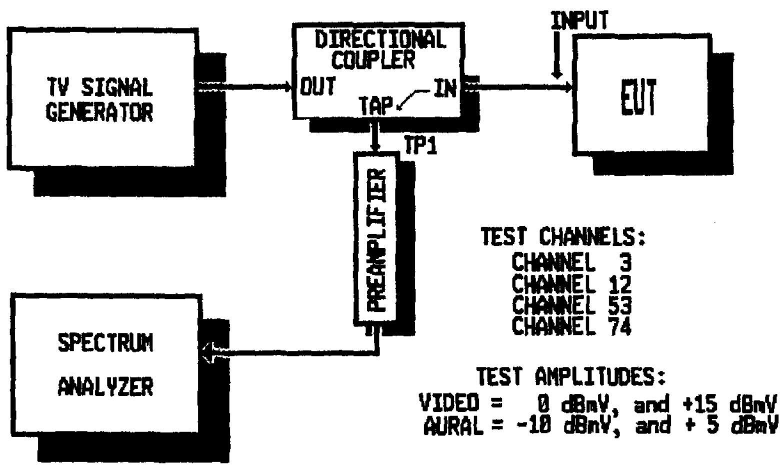

Figure 4.3 Local Oscillator and Backfeed Test Equipment Configuration and Test Parameters

spurious signals. Since this is an absolute measurement of the voltage appearing at the input connector of the EUT, a complete calibration must be performed over the entire test band prior to commencing the test.

The test procedure is relatively straightforward. The test generator and EUT are tuned to the desired test channel. The spectrum analyzer is adjusted to display the local oscillator frequency of the test channel. The amplitude of the modulated video carrier is adjusted for +15 dBmV at the input to the EUT. The aural carrier is unmodulated and adjusted for a level 10 dB below the visual carrier. The amplitude of the local oscillator is measured on the spectrum analyzer. The test is repeated for a visual carrier level of 0 dBmV.

"Backfeed" is generally defined as any spurious signal emanating from the tuner back toward the cable delivery system. For this test, the spectrum is scanned, using the spectrum analyzer, in 100 MHz increments to a maximum frequency of 600 MHz. Any spurious emissions identified in the scanning process which exceed -35 dBmV are measured and recorded.

4.3.3 A/B Switch Isolation

Devices which have two selectable RF input ports are to be tested for isolation between the non-selected input port and the selected input port (A to B and B to A) and between the non-selected input port and the output port (A to C and B to C). Figure 4.4 shows the switch configuration and lists the isolation tests to be performed. In addition, the A/B switch internal to a VCR will be tested for isolation between the input and output port when the VCR is operating in the "VCR Play" mode. Figure 4.5 shows the switch configuration for the VCR internal switch isolation test.

4.3.3.1 Non-Selected to Selected Input Port Isolation

Figure 4.6 shows the test configuration for the non-selected to selected input port (A to B and B to A) isolation test. In this measurement procedure, an unmodulated (CW) signal is input at the non-selected input port (port A) of the EUT. The resultant signal level is measured at the selected input port (port B) using a spectrum analyzer. The ratio of the input level at port A to the measured output level at port B is the isolation of the switch (recorded in dB). The test is repeated with port A as the selected port and port B as the non-selected port. The test is repeated with power to the EUT turned off. If the non-selected input port is not internally terminated, a 75 Ohm terminator is used at the input to this port.

4.3.2 Non-Selected Input to Output Port Isolation

Figure 4.7 shows the test configuration for performing isolation measurements between the non-selected input port (port B) and the output port (port C) with a desired television signal input on the selected port A. Since it is not practical to gain direct access to port C, the measurement is performed at the baseband test point location using the signal substitution method described in Section 4.2.4.

In this procedure, a desired television signal is input at the selected input port A. The video carrier of the desired signal is modulated with a 0 IRE or 10 IRE flat field modulation and adjusted to a level of +0 dBmV. The desired aural carrier is unmodulated and adjusted to a level of -10 dBmV. An "undesired" CW signal is input at the non-selected port (port B) at a frequency between the video and aural carriers (approximately 2.55 MHz above the video carrier). This signal is adjusted to a level of +30 dBmV. Using a television measurement set with spectrum noise capability or a spectrum analyzer, the baseband spectrum is monitored at the

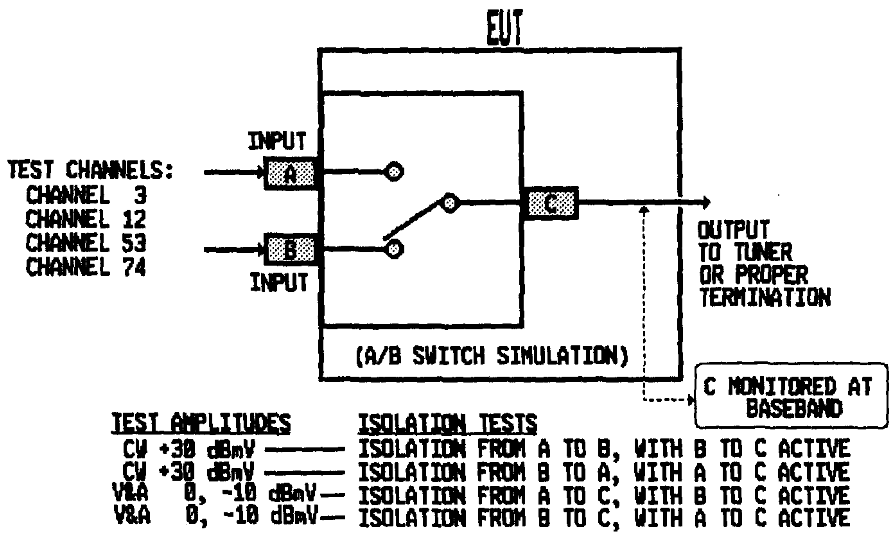

Figure 4.4 Switch Configuration and Isolation Test Parameters for Devices Having Two Selectable RF Input Ports

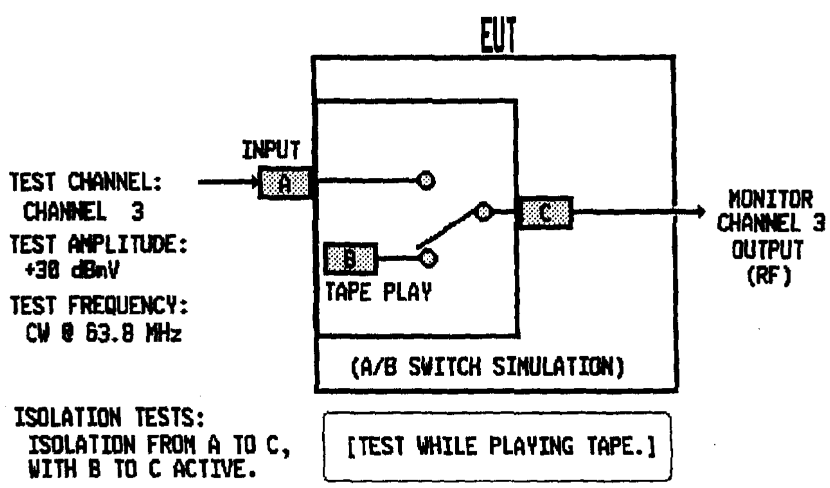

Figure 4.5 VCR Internal Switch Configuration and Isolation Test Parameters